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Marine Corps University
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TITLE: MARITIME PREPOSITIONING FORCE 2010: WHAT ARE THE OPTIONS

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AUTHOR: MAJOR K. E. RUTKOWSKI

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Mentor: Dr. John P. Cann
Approved: _____
Date: _____

Mentor: LtCol David G. Reist, USMC
Approved: _____
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Abstract <p>The Marine Corps Maritime Prepositioning Force (MPF) has proven itself as a capable strategic force multiplier. To meet the challenges of a likely chaotic future, the Marine Corps is developing its OMFTS concept with a focus on generating overwhelming tempo and momentum against critical enemy vulnerabilities through littoral maneuver, minimal force footprint, and sea-based command, control, and logistics. The current MPF program is not consistent within the limitations of this concept. To maintain MPF's viability, several alternatives are being examined for the MPF 2010 concept. Capabilities range from those similar to that of today through a mobile offshore base that is capable of receiving C-17 Aircraft. The alternative labeled as option D is the only choice that substantially meets all the requirements for MPF 2010 and has the greatest opportunity to endure through the middle of the 21st Century. It will permit the operation of all MAGTF Elements from a Sea-Base, Eliminate Host Nation Support Requirements, and reduce the vulnerability to Asymmetric Threat. The value of Option D to provide the capabilities required for OMFTS, increasing forward-deployed deterrence, and giving the combatant commander a flexible and powerful force that can rapidly respond needs to be advertised to justify the cost of acquisition and assure its development.</p>		

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MARITIME PREPOSITIONING FORCE 2010: WHAT ARE THE OPTIONS

Since its inception, the Marine Corps Maritime Prepositioning Force (MPF) has proven itself as a capable strategic force multiplier. The current MPF program is organized into three squadrons of prepositioning ships, each carrying the majority of equipment and 30 days of supplies to support a brigade-sized Marine Air Ground Task Force (MAGTF) of 17,000 Marines and Sailors. These squadrons are forward based at Diego Garcia, Guam/Saipan, and in the Mediterranean with the on-call mission to quickly transit to a designated operations area. The ships, designed for point-to-point delivery, offload their administratively stored cargo at a suitable and secure port or beachhead near the objective. Using a large staging area, the correct equipment and supplies are then organized and associated to the appropriate unit of the airlifted MPF MAGTF. In a secure environment, this process provides a formidable combat ready force in usually less than ten days. This MPF capability gives the Unified Commanders a credible forward presence, and when employed, a flexible range of power projection that can be tailored to rapidly respond to all levels of crisis within their areas of interest.

The fall of the Soviet Union left the United States as the sole superpower to confront a chaotic world with vast political instability and military complexity. Ethnic conflict, outlaw states, and terrorist factions are creating unprecedented threats to regional stability. The focal point of this instability will likely be the world's littorals, where over three-quarters of the world's population, 80 percent of the world's capital cities, and nearly all sources for international trade are located. To meet these challenges,

the U.S. National Military Strategy (NMS) requires the armed forces to maintain versatile, yet powerful forces that can respond quickly to fast-breaking events in regional situations. As the number of overseas bases decline and the amount of U.S. military personnel permanently stationed overseas dwindles, the demand for flexible, responsive, sea-based forces become imperative.¹ The Marine Corps' answer to this direction is in the development of the Operational Maneuver from the Sea (OMFTS) concept. OMFTS focuses on generating overwhelming tempo and momentum against critical enemy vulnerabilities through littoral maneuver, minimal force footprint, and sea-based command, control, and logistics.

OMFTS requires that a radical new approach be taken towards the MPF program. OMFTS does not provide for establishing beachheads or port facilities to maintain large shore-based logistics depots that would tie the force to a single base of operations and require a large contingent for rear area security. The current doctrine for employment of MPF is not consistent within the limitations of this concept. To maintain the program's viability within OMFTS, the Marine Corps started development of the MPF(Future) concept. The basis of MPF(F) envisioned the conduct of arrival and assembly operations at sea, transferring assets directly to the Amphibious Ready Group (ARG) after the original force had made its assault. The concept was greatly expanded to include continuous logistics support from the sea and the elimination of all host-nation support requirements. These aims can only be met with the development of a totally new MPF platform. The MPF 2010 and Beyond concept grew out of this with the goal to provide an MPF sea-base platform from which combat-ready Marines can be deployed and sustained.

¹ United States Marine Corps, *Concepts and Issues 2000*, (N.p.), 3.

Several MPF 2010 alternatives have been developed within a wide range of capabilities and costs. This range is bound on the lower end with capabilities similar to that of today's MPF ships and on the upper end with a Mobile Offshore Base (MOB) that is capable of receiving C-17 strategic aircraft. This paper will focus on these options after a review of the historical development of the MPF program, the importance of capabilities it provides, and the driving factors that led to the pursuit of a combat-ready sea-based prepositioned force. This will provide a basis to determine if the MPF 2010 options are feasible within the limitations of OMFTS and whether its increased capabilities justify the cost of acquiring the new platform.

The Emergence of Maritime Prepositioning

The utility of maritime prepositioning has been known for some time. In 1950, Rear Admiral Henry E. Eccles championed the concept of advanced "floating bases" to support forward deployed forces "where the supplies, services, and replacement of equipment are provided from auxiliary ships and craft based within an anchorage."² The concept sat idle until 1964, when the U.S. Army created the Forward Floating Depot (FFD) Ship Squadron. It was configured to provide broad based materiel support to a generic three-brigade task force in the Pacific Ocean region. The FFD equipment and supplies proved beneficial during the early days of the Vietnam War. In answer to the massive Warsaw Pact threat, the Army called upon its FFD experience to initiate the Prepositioning of Organizational Materiel Configured in Unit Sets (POMCUS) program. Throughout the 1970's, the program prepositioned large amounts of land based

² Albert A. Washington, LtCol, USMC, *U.S. Army and Marine Corps Maritime Prepositioning: The Right Course for the 21st Century?*, (Washington D.C.: National Defense University, 1994), 2.

equipment and supplies that could be immediately married to incoming combat units airlifted from the Continental United States (CONUS).³ Unfortunately, the demands of POMCUS and emphasis on the European Theater led to the abandonment of the FFD program.

Maritime prepositioning reemerged in 1980 under the Marine Corps Near-Term Prepositioning Ships (NTPS) program. The program was initiated in response to the Iranian hostage crisis and the Soviet Union's invasion of Afghanistan. These events gave the United States and Carter Administration a jolting lesson on the importance of strategic reach when the world's leading superpower suddenly found itself incapable of projecting a credible forward presence. Significant concerns were raised in regards to the nation's ability to effectively project adequate forces to retain open access to Middle East oil supplies. This led to the pronouncement of the Carter Doctrine in January 1980.⁴

The Carter Doctrine proclaimed that oil supplies in the Persian Gulf region represented a vital national interest. In February 1980, Marine Corps General P.X. Kelley was tasked to form the Rapid Deployment Joint Task Force (RDF) at MacDill Air Force Base near Tampa, Florida. The RDF mission was to establish credible power projection alternatives with the intent towards developing a realistic and sustainable presence in the gulf region that went beyond the existing capabilities resident in the carrier battle groups and amphibious forces.

The Marine Corps offered a solution in the form of a prepositioned Marine Amphibious Brigade (MAB) suite of equipment and 15 days of supplies embarked

³ Joseph Martin Jr., Col, USMC, *The Maritime Prepositioning Programs: A Combatant Commander's Force Equalizer and Logistical Lifeblood*, (Newport, RI: U.S. Naval War College, May 1996), 2.

aboard existing Military Sealift Command (MSC) shipping. The island of Diego Garcia in the Indian Ocean was identified as the location to position the ships for rapid response to threats in the gulf. With the backing of the Secretary of Defense, the NTPS program was established. By 1982, NTPS had grown to a squadron of eighteen ships that could support a MAB with 30 days of supply and provide selected bulk supplies to Army and Air Force units.⁵

From this, the maritime prepositioning program has followed an evolutionary course to increase capability and flexibility with the use of both changes in technology and innovations in tactics and techniques. The NTPS program was more of a deployment enhancement option. It required a modern port facility that could support the offload with cranes and assembly areas near an improved airfield. Equipment was not designated clearly to the unit level and required a significant amount of time for arrival and assembly operations. In 1984, the Marine Corps' portion of NTPS was greatly expanded and reconfigured into the Maritime Prepositioning Ships (MPS) program to make it more of a force multiplier option. MPS traded the MSC ships for thirteen modern contracted commercial roll-on/roll-off (RO/RO) cargo/container ships. These ships were divided into three squadrons (MPSRONS), with each embarked to support a MAB for 30 days and located throughout the world, as discussed earlier.

The MPS ships were much less dependent upon modern port facilities. The ships' organic cranes allowed equipment and containers to be lifted over the side without the aid of pier cranes, and their port and stern ramps provided the flexibility to discharge rolling stock in less developed ports. The MPS ships also had an in-stream discharge capability

⁴ Ibid, 2.

⁵ Washington, *U.S. Army and Marine Corps Maritime Prepositioning*, 6.

by maintaining barges and lighterage on the ships that permitted the transport of equipment over the shore to the beach used for assembly and staging operations. This capability eliminated the requirement for a developed port facility and offered an alternative for MPF employment wherever the fly-in echelon (FIE) could land near a beach or degraded port suitable for assembly.

The remote and static deployment of the NTPS program produced a number of problems, the largest of which was the degradation of the equipment in storage. The MPS program initiated a scheduled maintenance program to avoid this and maintain the prepositioned equipment in a combat ready status. This permitted the rapid issue of equipment when needed after only a short preparation period. Addressing the NTPS deficiency in equipment designation, MPS placed great emphasis on clearly identifying every piece of equipment down to the unit level. These efforts brought the arrival and assembly process down to the current level of 10 days or less.

Development began in 1989 to incorporate force module packages within the MPF program to add options of employment using less than a full MEB configuration. Force modules are equipment packages of varied sizes and missions developed to provide employment and deployment flexibility, reduce ready-to-operate time, and enhance force sustainment. The loads aboard MPF ships were reconfigured to create four priority force modules that range in size of support from a Marine Expeditionary Unit (MEU) sized MAGTF of as little as 2,700 Marines, to two MEB(-) MAGTFs of approximately 10,000 Marines and varied capabilities, to the full MPF MEB. Detailed load plans configured assets to allow early access to specific force module equipment and minimize the amount

of FIE airlift required. These load plans were accomplished without altering the original MPSRON equipment list or removing the spread-load structure.⁶

Force modules can be used in a wide range of missions that include disaster relief, humanitarian assistance, regional crisis, and regional conflict. The smaller spectrum missions can be supported without deploying a full MPSRON, and the modules can be employed without offloading the entire ship. This leaves the remaining assets available to support other contingencies that may arise at the same time. The result is a complete range of MPF employment alternatives that allow combatant commanders to task organize a force to provide a specific capability. The experience gained in the development of force module packages contributed greatly to dispelling the belief that the proposed combat configured load plans of MPF 2010 are not economically feasible.

The Maritime Prepositioning Force of Today

Although significantly refined and in the midst of tremendous change, the MPF program has essentially remained the same throughout the 1990s. The Marine Corps views the MPF program as a strategic power projection capability that combines the capacity and flexibility of prepositioned sealift with the speed of strategic airlift that can respond for combat, disaster relief, or humanitarian assistance operations. Strategically placed around the globe, MPF supports the Strategic Mobility Enhancement initiative and National Military Strategy (NMS) through forward presence and crisis response. The three MPSRONS have been organized to be interoperable, with ships from one MPSRON interchangeable with ships from any other, and to be flexible, able to employ from one to

⁶ Center for Naval Analyses, *Improving MPF Operational Effectiveness: Lessons learned from Past Exercises and Operations*, Report by Mark Geis and William A. D. Wallace, 1 August 1993, 6.

all thirteen ships depending on the situation. The mission of the MPF MAGTF is to maintain the capability to perform the following tasks:

- Conduct both ground and air operations interoperable with joint forces deployed in theater before or afterwards.
- Reinforce an amphibious operation.
- Occupy/reinforce advance naval bases.
- Occupy and defend along key lines of communication.
- Support an ally or friendly nation through forward presence.
- Send a political/diplomatic signal.
- Establish a sizeable force in support of a sustained operation ashore.
- Provide humanitarian/disaster relief.⁷

When employed, MPF ships move to a crisis region and offload equipment and supplies in a benign environment, either in port or offshore, which are then married up with the MPF MAGTF arriving at a nearby airfield. A full MPF MAGTF is comprised of a Marine Expeditionary Force (MEF)-Forward Command Element (CE), Ground Combat Element (GCE), Aviation Combat Element (ACE) with fixed and rotary wing assets that are airlifted or flight ferried into theater, and Combat Service Support Element (CSSE). The end result is a rapidly established, combat ready MAGTF that exemplifies the NMS principles of strategic agility, overseas presence, power projection, and decisive force. These factors lead to the MPF program remaining one of the most cost effective, proven,

⁷ United States Marine Corps, *The Role of the Marine Corps in the National Defense*, (N.p., 1991), 2-5 – 2-8.

and relevant capabilities for use in responding to crises overseas. This was clearly shown with its employment during Operation Desert Shield.⁸

Validation of the MPF Concept

The culmination of MPF's value was witnessed in August 1990, with its employment for Operation Desert Shield. On 7 August 1990, MPSRON-2 was given the order to deploy from its home station at Diego Garcia and transit to the modern port of Al Jubail, Saudi Arabia. Three of the five ships sailed immediately and arrived in Al Jubail on 15 August. The two remaining ships were undergoing maintenance and arrived on 26 August. Within eight days after entering the air deployment flow, the 7th MEB had offloaded the equipment and supplies from MPSRON-2 and assumed defensive positions to the north of the port. On 8 August, MPSRON-3, based at Guam, set sail and arrived at Al Jubail on 29 August. The 1st MEB unloaded MPSRON-3 and was in position by the first week of September. When a further build-up was ordered in preparation for the conduct of Desert Storm during November 1990, MPSRON-1 brought the number of MPF supported Marines to over 51,000.⁹

Within 30 days of the deployment order, MPF ships enabled the United States to position two heavy brigade-sized MAGTFs in Saudi Arabia, while making minimum demands on scarce airlift. This force provided the primary allied armor capability in theater through the end of September. The decision was made to prioritize deployment of ground combat forces over theater logistic forces to amass the greatest amount of combat

⁸ USMC, *Concepts and Issues 2000*, 60.

⁹ Martin, *The Maritime Prepositioning Programs*, 9.

power as soon as possible. This led to severe logistical shortages in many U.S. Army units. MPF stocks were able to support these units until the theater logistics structure matured in mid-November, which prevented the necessity to make emergency changes to the deployment schedule.

Desert Shield provided the first opportunity to observe the capabilities to offload, sort, and distribute an entire MPF load. It identified some serious deficiencies and made planners aware of certain realities that will be discussed later, but without a doubt, it highlighted its worth as a strategic asset. This performance becomes even more impressive when throughput numbers are taken into account. In total, the three MPSRONS offloaded approximately 8,380 pieces of rolling stock and 7,325 containers that would have taken months to arrive from CONUS on Ready Reserve vessels. U.S. lawmakers and potential adversaries alike took notice of this ability to respond significantly quicker than a buildup originating from CONUS. MPF was certified as a credible forward presence, and with its arrival into a region, the world is given a strong message that the United States is prepared to respond.¹⁰

Despite its success, the Marine Corps began exploring possible improvements for the deficiencies identified during the Desert Shield MPF offload. The most serious deficiencies included (1) a lack of adequate material handling equipment (MHE), (2) poor access, sorting, and distribution procedures for containerized supplies, and (3) inadequate tracking and accountability procedures once the equipment and supplies were offloaded.¹¹ The MHE situation could only be marginally improved due to space

¹⁰ CNA Report, *Improving MPF Operational Effectiveness*, 11.

¹¹ Ibid, 11.

limitations. These efforts included reprioritizing the equipment list to add some additional MHE, and incorporating early access to all MHE assets into the load plan. The other two issues focused on organizational and procedural enhancements for improvement.

Container packaging techniques were significantly enhanced to maximize the use of existing containers. This resulted in a more organized manner of storage and easier access to specific items, such as individual repair parts or certain classes of supply. It also released space for more equipment and supplies to be embarked. Additionally, easy access to specific capabilities embarked within containers was designed through the development of capability and habitability sets. Examples include command and control sets, bulk fuel and water habitability sets, and expeditionary airfield sets. These sets allow access to key equipment and supplies during the initial offload period to assist in a more expeditious establishment of the force.¹²

Methods for enhanced accountability procedures were identified to keep better track of assets once placed in the distribution process. These include procedures for organization and control of the assembly and staging areas, as well as, requirements for personnel to manage the process. Additional improvements were also realized with the development of an accurate and reliable ADP system for tracking the status and accountability of the offload. Overall, these deficiencies did not significantly detract from the success of the MPF employment for Desert Shield, and attention given to them was mostly in the form of internal refinements. Outside the Marine Corps, much more

¹² David G. Reist, LtCol, USMC, *MPF Employment*, (Quantico, VA: Marine Corps War College, May 2000), 6.

attention was given to the positive results of this first validation of the MPF concept in a real-world crisis.¹³

Taking Notice of Mobility Shortfalls

The time required and difficulties experienced with the mobilization for the Gulf War alarmed many within Congress and the Department of Defense. Using all available strategic airlift and Ready Reserve Fleet shipping, the buildup of sufficient combat power took six months. Questions such as, “What if Iraq had continued its assault into Saudi Arabia?” and “What if adequate airfields were not available to accept the large strategic aircraft?” naturally came to mind. Those who asked these types of questions received an answer of MPF as the only capable force to quickly arrive in theater.

The Army was particularly dissatisfied in the performance and availability of strategic lift, especially sealift. It depended on the 96 ships of the Ready Reserve Fleet to move over two million tons of war material by sea routes totaling 8,450 nautical miles. Only 8 percent of their total lift requirements could be accomplished by air. The Ready Reserve Fleet experienced numerous delays because some ships had deteriorated due to prior year cutbacks in maintenance funding, and all faced the general problem of manpower in the form of qualified and able-bodied crews. The mean activation time for Ready Reserve Fleet vessels was 11 days. The accomplishments of the Marine Corps MPF program were not lost on senior Army officers and their logistics planners. They

¹³ CNA Report, *Improving MPF Operational Effectiveness*, 11.

began exploring the expansion of the POMCUS program to additional sites overseas and developing a maritime prepositioning program of their own.¹⁴

It was readily apparent that the aging strategic airlift fleet and maintenance burdened Ready Reserve Fleet would be much less capable in the future. Under a mandate established by Congress, the Department of Defense initiated the Mobility Requirements Study (MRS) in January 1991 to determine the future strategic mobility requirements of the armed services and to develop a comprehensive plan to meet those needs. Particular emphasis was placed on maximizing the benefits of prepositioning throughout the armed forces. The study participants consisted of the Secretary of Defense, the Joint Staff, all service headquarters, and U.S. Transportation Command with its component commands: Military Sealift Command, Air Mobility Command, and Military Traffic Management Command.¹⁵

Volume I of the MRS was completed on 23 January 1992, providing findings and recommendations for inter-theater mobility, CONUS infrastructure, and supporting sealift requirements. To meet sealift requirements, the study recommended the acquisition of 20 Large, Medium Speed RO/RO (LMSR) ships, 23 modernized commercial RO/RO vessels, and the retention of eight Fast Sealift Ships to support the requirements for “crisis-response” forces. MRS also recommended the creation of an Army heavy-mechanized “gap filler” force aboard prepositioning ships that can hold an initial entry point for follow-on forces. This “gap filler” role established the capability requirements for the Army Prepositioning Afloat (APA) program. Several additional recommendations for the other services and mobility commands were provided as well;

¹⁴ Washington, *U.S. Army and Marine Corps Maritime Prepositioning*, 8.

of which, the replacement of the aging strategic heavy lift aircraft was the most difficult to overcome. The bleak picture that the study painted, elicited strong support from the administration and Congress to improve strategic lift capabilities. The MRS recommendations were approved and adopted as the basis for the Strategic Mobility Enhancement (SME) initiative, with authorizations provided to fund the initial sealift enhancements.¹⁶

The SME initiative started a flurry of activity and forward-thinking within the services to develop programs, platforms, and doctrine that would facilitate a rapid crisis response using dominant force. The Army established the APA program as the cornerstone to their Army Strategic Mobility Plan, which has the objective to be capable of deploying a sustainable corps of five divisions anywhere in the world within 75 days. The APA program strongly resembles the Marine Corps' MPF program, including the incorporation of force modules. It has similar capabilities of rapid response, in-port or in-stream discharge, and 30 days sustainment; however, it does not provide ship interoperability and cargo flexibility. APA is designed to permit the rapid deployment and employment of an Army heavy brigade consisting of two tank battalions, two mechanized infantry battalions, and combat support units. Although the mission of the APA force is worded almost identically to that of the MPF force, the intent is for it to be a complimentary capability that uses the advantages of prepositioning within the Army structure.¹⁷

¹⁵ Ibid, 9.

¹⁶ Ibid, 10.

¹⁷ FM 100-17-1, *Army Pre-Positioned Afloat Operations*, (Washington D.C.: Department of the Army, July 1996), 1-2.

The strictly mobility enhancing focus of APA resulted in some inherent weaknesses within the program. To maximize use of embarkation space, certain tactical limitations were accepted. Equipment capabilities are not spread-loaded throughout the APA fleet, so the loss of any ship to maintenance, partial commitment, or combat loss results in the loss of the entire capability of that equipment. The load plan does not provide for easy access to embarked items or the ability to move material throughout the ship. To access an item, a time consuming offload of all its obstructing cargo is required. Additionally, the LMSR ships selected for APA have a draft of 35 feet. While the ships hold a significant amount of equipment, their draft depth seriously limits port access throughout the world. Ships should have been selected similar to those of MPF, which have a draft of 32 feet.¹⁸ These limitations, while significant to Marine Corps planners, are acceptable within the Army's SME design for employment. The APA program is in its infant stages and overall, it is heading in a positive direction with plenty of room for improvement.

The other services initiated improvements as well. The Air Force established three ships for the prepositioning of ordnance. These ammunition ships allow a rapid response without taxing strategic airlift for the movement of initial stocks of ammunition. They also developed expeditionary force packages to enable faster employment of unit capabilities and more efficient use of airlift. The Navy and Marine Corps, already forward deployed and poised for rapid crisis response, began development of doctrinal concepts that would maximize use of the sea for the quick application of dominant force. One of their first tasks was to identify the limitations of MPF and develop a means to overcome them within the new concepts.

¹⁸ Reist, *MPF Employment*, 12.

The Limitations of MPF

Several limitations have been identified with the current MPF program. Some of them were highlighted during the Gulf War, but the majority of them were realized by speculating the probable difficulties that would have been experienced, if the employment scenario was less advantageous. Understanding the seriousness of these limitations will help provide a basis for determining the relative importance of certain capabilities presented within the options for MPF 2010. The following will briefly discuss the limitations of MPF as applicable to its current doctrine.

Port Requirements

The most efficient method for employing MPF requires the use of a suitable port. Port characteristics of interest include draft depth, berth space, infrastructure (i.e. piers, lift equipment, warehouse space, and utilities), staging area, and a road network. It is unlikely that future MPF operations will enjoy the use of ports approaching the capabilities of the ideal and modern facilities provided by Saudi Arabia. The use of a substandard port greatly hinders the offload, assembly, staging, and onward movement of the MPF force. This was clearly shown by the difficulties experienced during the partial MPF offload in support of the humanitarian relief operation Restore Hope in 1992. The Mogadishu port in Somalia had been devastated by two years of civil war and offered few positive characteristics. It had marginal port depth, only one berth space available for MPF ships, little infrastructure, and limited assembly/staging area. MPF was a great success in support of the operation, but concern should be raised over the 17 days it took

to conduct the partial offload in an environment without a high threat of enemy interference.¹⁹

Another aspect that should be considered is that a host nation may not be willing to permit the use of a port. This situation could arise for a number of reasons. A ship is a large profile vessel and may attract unwanted attention that would aggravate any volatile political or ethnical pressures within the host nation or that could further destabilize the region. Hostility could also occur from a nation economically unable to give up its commerce lifeline. A full MPF offload would virtually shutdown all other significant operations for the majority of the world's ports. Whatever the reason preventing the use of a suitable port, the only alternatives are to take a port by force or conduct an in-stream discharge.

In-Stream Discharge

An in-stream, or offshore, discharge of the MPF force must normally be considered a choice of last resort. While feasible and flexible as an alternative discharge option, the process is difficult, time consuming, and constrained. Before discharge operations can begin, a suitable beach that permits adequate defense, assembly and staging area, and access by the FIE must first be identified and prepared. Additionally, the procedures required to place the ships' lighterage into service to support this form of discharge are laborious and complicated. These requirements for this option, added to its environmental constraints, make it less than ideal and greatly increase the time required for employment of the force.

¹⁹ CNA Report, *Improving MPF Operational Effectiveness*, 11.

The most serious constraint to in-stream discharge is its vulnerability to weather. It cannot operate above sea-state 3. Even in this situation with waves of 3 to 5 feet operations are greatly reduced. The fact that most of the world's waters are in sea-state 3 or greater 70 percent of the time, severely limits its usefulness. For instance, the sea-state off the Horn of Africa would not have permitted this option for Operation Restore Hope.²⁰

Airfield Requirements

A large airfield is required in close proximity to the MPF port operations. The airfield characteristics must have the length and weight capacity to be capable of accepting the large strategic aircraft that will deliver approximately 250 sorties transporting the FIE personnel and equipment not prepositioned. Of particular importance, the airfield must have the cargo handling capability and ramp space to permit continuous operations in order to receive the large number of aircraft while other craft are on the deck. For this, the airfield will require at least 10,000 feet of stabilized surfaced runway, 1.5 million square feet of ramp space, and an all weather capability. This will allow the efficient scheduling of aircraft, timely offload, and organized staging of personnel and equipment. A deficiency in the airfield's capability will significantly disrupt the rapid employment of the MPF MAGTF. Additionally, to prevent interference with transport operations, an airfield must be available to operate the MPF MAGTF tactical aircraft. This is another area in which we will not likely be so lucky as we were in the Gulf War. During Operation Restore Hope, the Mogadishu airfield required constant improvement and

²⁰ Ibid, 13.

maintenance to accommodate only two C-5 aircraft simultaneously, which seriously slowed operations and highlighted the importance of an adequate airfield.²¹

Reconstitution

Reconstitution of MPF equipment and supplies must be accomplished quickly in order to regain the capability to respond for other operations. The requirement may arise for the MPF force to be withdrawn from a current operation to be employed elsewhere. This would be a very difficult task to accomplish. Indeed, the reconstitution process is a laborious and difficult operation that has not received sufficient attention. Accountability and management procedures have been somewhat improved, as discussed earlier, but they have not developed to a point that facilitates a quick and organized re-embarkation of the MPSRONs. As an example, the complete reconstitution of the three MPSRONs after the Gulf War took nine months for the embarkation phase and over three years to complete the maintenance and restock phase.²²

Vulnerabilities

MPF is a very vulnerable and lucrative target for any potential adversary. Without a self-defense capability, the MPSRONs require naval escort in all phases and a large security force to protect the offload and assembly area. They are most vulnerable during the discharge process, when they are easily targeted, stationary, and loaded with large quantities of fuel and ammunition. When using port facilities, host nation labor is normally employed to assist the operation. It would thus be difficult to prevent terrorist

²¹ Reist, *MPF Employment*, 15.

activity by a sympathetic laborer. Future enemies are not likely to have the same approach as Saddam Hussein. They will most likely confront us asymmetrically, and the MPF offers the relatively easy and high payoff target they will be looking for.

MPF(Enhanced)

Acting upon the SME initiative, the Marine Corps purchased an enhancement package that would improve some of MPF's limitations and increase its overall capability. It included the acquisition of three ships to bring an expeditionary airfield, a Naval Mobile Construction (SeaBee) Battalion, and a 500 bed fleet hospital to the fight. It also permitted the return of equipment and sustainment that was removed to make space for 28 additional M1A1 Tanks within each MPSRON. The expeditionary airfield will provide a means to employ tactical aircraft, if a suitable airfield is not available. The SeaBee Battalion will provide an enhanced engineering capability that can be used to improve port facilities or beach operations, establish rear area infrastructure, and build defensive positions. The additional M1A1 tanks provide a formidable presence for response or defense, and with the enhanced space, equipment that they would have displaced is still available. This prevents the need for additional FIE sorties. Two of the three ships have recently been incorporated, and the third is still awaiting appropriations.²³ This enhancement package is viewed as an interim improvement while the Marine Corps develops the MPF platforms and doctrine of the future. As will be shown, the above limitations were considered closely for the desired capabilities of MPF 2010.

²² Martin, *The Maritime Prepositioning Programs*, 15.

²³ USMC, *Concepts and Issues 2000*, 60.

Evolving to Face the Future

Taking advantage of the improvements gained by the SME initiatives, the United States prepared the 1997 National Military Strategy with a visionary approach for preparation, shaping, and increased response. It established the principles of strategic agility, overseas presence, power projection, and decisive force. These principles provided the foundation for *Joint Vision 2010* and the updated *Joint Vision 2020*. The Joint Vision (JV) provides a conceptual template to guide the services through a transformation into a force that is dominant across the full spectrum of military operations.

The JV's overarching focus of full spectrum dominance will be achieved through the interdependent application of dominant maneuver, precision engagement, focused logistics, and full dimensional protection. This implies that U.S. forces are able to conduct prompt, sustained, and synchronized operations with tailored forces that have the freedom to operate in all domains of sea, land, air, space, and information. Additionally, this requires that the United States maintain or improve its overseas force presence and its ability to rapidly project power worldwide. JV identifies asymmetric attack as one of the most serious threats faced by the United States. It calls for the development of doctrine, tactics, and technology to effectively counter potential adversaries who may take this asymmetric approach as a means to identify and exploit our key vulnerabilities. Focused logistics will provide the backbone for JV's new direction by capitalizing on improvements in processes and technologies to ensure delivery of the right requirements, at the right time and place. The ideas in JV 2010, as carried forward in JV 2020, are

innovative and form a vision for integrating doctrine, tactics, and technology into new operational capabilities.²⁴

The Marine Corps' response to JV's guidance was the development of its capstone concept of OMFTS. This required taking a radically new approach to its primary mission of littoral power projection through the application of maneuver warfare to the full spectrum of conflict challenges in, and around, coastal waters. In the absence of adjacent land bases, a sustainable forcible entry capability that is independent of forward staging bases, friendly borders, overflight restrictions, and other politically dependent support can come only from the sea. OMFTS envisions the use of sea-based logistics, fires, and command and control, so forces ashore will be liberated from establishing large shore based logistics depots and providing rear area security to protect them. This will permit the freedom of littoral maneuver and focusing energies against critical enemy vulnerabilities. The following are the tenants of OMFTS that will enable naval forces to act so quickly that the enemy will not be able to react effectively until it is too late.

- Focus on operational objectives.
- Use the sea as a maneuver area.
- Generate overwhelming tempo and momentum.
- Pit strength against weakness.
- Emphasize intelligence, deception, and flexibility.
- Integrate all organic, joint, and combined assets.²⁵

²⁴ Joint Chiefs of Staff, *Joint Vision 2020*, (Washington D.C.: GPO, June 2000), 3-6.

²⁵ United States Marine Corps, *Warfighting Concepts for the 21st Century*, (N.p.), I-3 – I-11.

OMFTS provides a framework for several additional functional concepts that will facilitate its implementation. Of these, only the concepts of Ship to Objective Maneuver (STOM), Seabased Logistics, and MPF(F) will be discussed. STOM is the tactical application of OMFTS, turning the littorals into vulnerable enemy flanks that are assailable at the time and place of the naval commander's choosing. Departing from the traditional amphibious operations aim of seizing beaches, it envisions amphibious assaults with highly mobile surface and vertical lift platforms that launch from over the horizon to attack objectives deep inland. This eliminates the requirement for stopping to seize, defend, and build up beachheads or landing zones. STOM has the advantage of achieving tactical as well as operational surprise, which is something that was seldom possible in past amphibious operations.²⁶

Seabased Logistics is the facilitator for the successful implementation of STOM and OMFTS as a whole. Neither of these concepts can expand further than the logistics capabilities can be developed. The Seabased Logistics concept describes a means to support littoral power projection from over the horizon, independent of land-basing requirements and sovereignty restrictions. It will employ an integrated over the horizon floating distribution center and maintenance facility to provide indefinite sustainment. By cutting out the intermediate step of establishing shore-based logistics activities and eliminating the operational pause associated with that effort, improved efficiency in material management can be realized. Total asset visibility will be the key to improving this operational awareness of sustainment support and reduced logistics response time. Seabased Logistics will minimize the logistics footprint on shore, thereby freeing combat

²⁶ Ibid, II-3 – II-10.

forces from rear-area security duties and eliminating the vulnerability to the force's lifeline.²⁷

The radically new approach of OMFTS, required an equally radical approach be taken to maintain MPF's viability to contribute in forward presence and power projection. OMFTS limits the occasions that would allow for the establishment of shore bases and customary MPF offloads. The MPF(F) concept envisions conducting arrival and assembly at sea, follow-on operations from over the horizon, and profiting from all the advantages outlined in OMFTS. Turning the concept into an operational reality proved to be a difficult challenge. It became increasingly clear that the program would have to be greatly expanded to succeed, and as the concept requirements were identified, that MPF(F) is the only conceivable option that is currently available to enable the above concepts to be substantially realized.

The original concept scenario for MPF(F) had the MPF force "re-cocking" the ARG's L-class ships after the initial amphibious landings had been made. MPF equipment and supplies would be cross-decked from the MPSRONS to the empty ARG vessels, and the FIE would be transported from the closest airfield directly to the ARG ships. The MPF force could then integrate into the current operation or conduct a subsequent amphibious operation as a tactically configured, combat-ready, and able maneuver element. The difficulties with this scenario were numerous. Current equipment and space limitations would not easily support the cross-decking operation, and it would have other variables, such as weather, that might also limit efforts. Solutions were not available as to how the FIE Marines and equipment would be transported or what would happen if a suitable airfield was not near the area of

²⁷ Ibid, XI-3 – XI-5.

operations. The greatest concern was in finding a way to command, control, and sustain two forces from the same ARG vessels.²⁸

MPF(F) planners came to the conclusion that the concept would require a totally new platform. In 1998, the Defense Science Board (DSB), an advisory board to the Secretary of Defense, released its findings from a review of MPF that reinforced this conclusion. The DSB concluded that MPF in 2010 needed to reflect an offshore expeditionary seabasing venue, utilizing a new platform design that would facilitate the requirements of OMFTS and Seabased Logistics. This would provide a center of power projection and forward presence based on the four pillars of force closure, amphibious task force integration, indefinite sustainment, and reconstitution for rapid deployment. The DSB recommended the development of advanced capability characteristics for the new MPF ship design, as well as several supporting platforms. While within current technological capabilities, DSB stated that affordability is the largest issue for the concept to overcome.²⁹

MPF 2010 and Beyond

The goal of MPF 2010 is to provide a sea-base from which combat-ready Marines can be deployed and sustained, thereby eliminating the need for ties to fixed land positions and host nation support. The enhancements envisioned in *MPF 2010 and Beyond* will expand the functionality of the future MPF across an increased range of contingencies while

²⁸ Center for Naval Analyses, *Assembling the MPF Offshore: Operational Maneuver and the Evolution of the Marine Corps' Maritime Prepositioning Force*, Research Memorandum 96-89 by Thomas A. Bowditch, August 1996, 5-6.

²⁹ Reist, *MPF Employment*, 21.

maintaining its current capabilities. MPF 2010 ships will require capabilities and functional support that are not in the current ships. With the new focus and the cooperation of the Navy, the Marine Corps identified the requirements, capabilities, and mission of MPF 2010 so that the concept could move from paper to water.³⁰ MPF 2010 will retain the current program's mission plus the following additional capabilities:

- Provide Combatant/Joint Force Commanders with an operational and logistical support capability to meet varied expeditionary missions ranging from projecting combat power ashore through OMFTS and STOM to conducting independent operations such as Smaller Scale Contingencies.
- Possess mission capabilities that interface with other Marine, Naval, Joint, interagency, and combined forces/systems.
- Maintain the capability for rapid deploy of Marine Air Ground Task Forces, associated Navy elements, and other services/forces as required, to enable joint maritime expeditionary operations.
- Conduct operations ranging from the current Maritime Prepositioning Ship capability, to exploiting the sea as maneuver space from over the horizon, to operating while dispersed, all while supported by force protection to match the threat. A forcible entry capability will not be possessed.³¹

The operational capability requirements of MPF 2010 were developed with a clear understanding of its role under OMFTS and of the current program's limitations. Framed within the four mission pillars identified by DSB, the following operational capabilities will promote MPF 2010's contribution towards future forward presence and power projection.

Force Closure:

- MPF 2010 will combine the capacity and endurance of sealift, with the enhanced speed and flexibility of airlift to marry-up forces and equipment in a

³⁰ USMC, *Warfighting Concepts for the 21st Century*, III-5.

³¹ John M. Curatola, Maj, USMC, MPF Requirements Officer, Marine Corps Combat Development Command, interview by author, 22 November 2000.

forward area. It will provide for the at-sea arrival and assembly of the MPF, eliminating the requirement for access to secure ports and airfields. Marine and Navy units will deploy by a combination of surface craft and strategic, theater, and tactical airlift to meet the prepositioning systems/platforms while underway or en route to objective areas.

- To facilitate this process, the platform shall incorporate air and surface interface points, as well as, personnel billeting and support facilities. It shall provide easy access to equipment for inspection, maintenance, testing, and selective configuration of tactical loads in order to arrive and assemble in the objective area, prepared for operations.

Amphibious Task Force (ATF) Interoperability:

- MPF will possess the capability to reinforce or augment the assault echelon of an ATF. It will not have an independent forcible entry capability.
- Within the overall power projection mission, MPF will be able to interface with the ATF and should interoperate with and potentially provide maintenance support for ATF aircraft, surface assault craft, and advanced amphibious assault vehicles. It must possess versatility through lighterage capabilities, cargo handling systems, and C4I interfaces to reinforce the striking power of an ATF.

Indefinite Sustainment:

- MPF must serve as a conduit for logistics support and sustainment. It must be able to receive, store, maintain, manage, and deploy the equipment and supplies to sustain logistics support of MAGTF operations for an indefinite period. This will be accomplished independently or as part of a larger sea-based logistics effort.
- Integral onboard cargo handling and delivery systems will provide for the selective offload of supplies, enable supplies to be transferred, be compatible with Naval and commercial delivery systems, and incorporate the means to deliver this support ashore.
- Should shore basing be required, it must possess the flexibility to support the logistics and maintenance efforts ashore.

Reconstitution and Redeployment:

- The MPF 2010 system/platform must be capable of in-theater, at sea, reconstitution and redeployment to expedite immediate employment for follow-on missions.³²

³² Ibid

The above missions and operational capabilities are the basis of a proposed mission needs statement that will need approval from the Chief of Naval Operations before proceeding further. It is likely that it will undergo many changes before a final product is released, but it is unlikely that the major theme will change. It will be integrated with the capability triad of fast deployment, reinforcement, and sustained sea basing to provide a wide range of employment from military operations other than war (MOOTW) to operations involving OMFTS. This triad simply conceptualizes the means to tailor the capabilities within the four pillars to support a specific mission.³³

The above requirements alluded to the magnitude of increased capabilities that MPF 2010 will provide. Specifically, it will expand from merely prepositioning assets and supplies to providing a sea-based platform that supports all operations, logistics, and human services for the MPF MAGTF. These capability requirements set the parameters for the next MPF ship/platform design. Each MPSRON will have to provide the human services, such as berthing, messing, health, and sanitary, to over 17,000 Marines. Even with very austere conditions, this demand will require a ground-up platform design to support this large number of Marines and maintain the same level of cargo capacity.

The operational requirements will drastically alter the MPF 2010 ship designs. Each MPSRON will require at least 27 operational rotary spots, and possibly flight decks to operate VSTOL fixed wing aircraft, to support air assault and sustainment operations of the MPF MAGTF. This will also require aviation hanger and maintenance space. Each ship will require a well-deck to interface with surface craft and at least 7,000 sq/ft to accommodate assembly, staging, and tactical configuring of assault waves. There

³³ USMC, *Warfighting Concepts for the 21st Century*, III-9.

must be an integrated C4I structure that will interface with the ATF and other naval, joint, interagency, and combined forces. A forcible entry capability is not required, as the MPF ships will not provide offensive fires. This will not prevent the use of the MPF MAGTF as a separate maneuver element that is within support of the ATF.³⁴

The basis of MPF 2010 is the provision of logistical requirements. MPF 2010 envisions that most combat service support functions will be provided from the sea-based CSSE. This will give unparalleled protection from asymmetric threats to the force's key vulnerability, concentration of combat forces on the objective, and uninterrupted sustainment. The ship's design must reflect on-demand access to stores and total asset visibility. This will require space for effective storage, identification, transfer, and movement of supplies. Systems will have to be designed to lift cargo to either air or surface discharge points. The design will have to provide for maintenance facility space as well. The load plans will have to permit a detailed level of combat configuration to efficiently employ MPF equipment with combat loads and maintain accountability. Combat loads will ensure that forces enter operations with initial requirements, and the better accountability will greatly increase the force's ability to reconstitute.

Of primary importance to the sustained seabased logistics effort, the new ship design must be capable of providing the sustainment distribution network. This requires the ability to receive, store, sort, and distribute all classes of supply. The distribution interface was discussed earlier with the requirements for rotary deck spots, well-deck, and internal lift systems. To receive the large quantities of supply that will be required, the ship's design must be compatible to interface with all naval, CLF resupply, and

³⁴ Maj Curatola interview.

commercial vessels. The ship must be designed to store and manage great quantities of all forms of sustainment. Each MPSRON will be required to maintain the current level of 3.1 million cu/ft of dry goods, but one-third of this will be palletized for easy access and selective retrieval, while the rest will be stored in densely packed ISO containers. Each MPSRON will also have to maintain 6.1 million gallons of fuel and 400,000 gallons of water, with the ability to make an additional 100,000 gallons of water per day. Additionally, each squadron will have to have 860,000 sq/ft of RO/RO cargo space. This allots space to preposition a large amount of the equipment currently brought with the FIE, which significantly reduces the FIE sortie requirements and simplifies its embarkation onto the MPF platform.³⁵

The MPF 2010 ship boundary conditions for design are similar to all new platform acquisitions. These include such aspects as a total ship system engineering approach that balances life cycle cost with performance, permitting rapid upgrade in response to evolving requirements, and maximum use of commercial-off-the-shelf systems. It will also include designs that permit sufficient flexibility for reconfiguration to support future purposes. It will be designed with the capability for level I survivability, having compartmentalized, internal ballasting, and fire fighting abilities. The platform must be capable of being manned by a civilian crew, which will require external protection when operating in a threat environment. The idea of incorporating point defense and passive countermeasure self-defense capabilities is being explored. Operationally, the new platform will be required to perform its mission in sea state 3, essential ship functions in sea state 5, and survive sea state 8. The current MPF

³⁵ Center for Naval Analyses, *MAA for MPF Future Sea-Basing Concepts: Volume I*, Research Memorandum 98-29 by John Nance Jr., June 1998, 34-36.

capabilities of RO/RO and LO/LO discharge, in-stream discharge, and access to the majority of worldwide ports will be maintained.³⁶ Appendix A provides a more detailed listing of the proposed capabilities and logistics requirements for MPF 2010 that was prepared by the I&L Strategy and Vision Team.

Options for MPF 2010

The lack of similar type platforms, as envisioned for MPF 2010, left insufficient data to accurately assess the affordability and feasibility of maintaining a sea-based logistics and power projection capability in support of OMFTS. To counter this, the Chief of Naval Operations directed the Center for Naval Analyses (CNA) to conduct a mission area analysis of the sea-basing concept for MPF 2010. The objective was to develop material options and costs that meet the sea-basing requirements of MPF 2010. The CNA conducted the study in two phases. In the first phase they developed a set of seven options ranging in capability. In the second phase they outsourced the development of conceptual designs and cost estimates to the ship design agents of Advanced Marine Enterprises, Inc. (AME) and Bland Lavis Associates (BLA).³⁷

For the first phase, CNA identified key cost drivers of the platform's operational requirements to develop a range of capability options associated to potential costs. The principle cost drivers were cargo stowage/accessibility, personnel accommodations, and aircraft basing capability. Aviation requirements were projected using VSTOL Joint Strike Fighters (JSF) as the replacement for all current tactical fixed-wing assets, and

³⁶ Maj Curatola interview.

³⁷ CRM 98-29, *MAA for MPF Future Sea-Basing Concepts: Volume I*, 1.

MV-22 tilt-rotor aircraft replacing the CH-46 and CH-53D helicopters. MPF 2010's requirement for a ship speed of 24 knots precluded the addition of expensive high-speed ships into the option list. The following will provide a brief description of the capability options developed by CNA.³⁸

Option A

Option A provides the lower range of capability comparisons. It would simply replace the current leased MPF ships with modified LMSR ships that maintain current capabilities and limitations. It would offer greater embarkation space to increase sustainment and preposition the majority of equipment currently brought with the FIE. It will not have any sea-basing or force employment capabilities. This is a viable option in the event that the total force sea-basing concept is not approved, as the lease of the current MPF ships expires between 2009 and 2011.³⁹

Options B and B(-)

Option B takes a large leap towards the objectives of MPF 2010. It provides for the accommodation of all MAGTF personnel minus the ACE. This totals to 10,600 Marines. All ACE personnel and equipment will be land-based at an airfield designated in close proximity to the area of operations. Operational spots for vertical lift assets are incorporated into this option to support force employment and sustainment by air, but no refueling or rearming capabilities will be specifically provided for the aircraft within the ship. This option has surface interface points for LCACs, small operational craft, and all types of resupply ships. It will provide the internal designs and systems to facilitate

³⁸ Ibid, 3.

³⁹ Ibid, 16.

accountability, organization, selective offload, and movement of assets and supplies throughout the ship. Capability for ground equipment maintenance, medical, and command and control support will be provided for as well.⁴⁰

These capabilities will satisfy the requirements for sustained sea-based logistics and force employment. The scenario envisioned for this option has the MAGTF CE, GCE, and CSSE marrying-up with the MPSRON at an Intermediate Staging and Embarkation Point (ISEP). The Marines and equipment would then be embarked onto the MPF ships, assembly and staging operations conducted while enroute, and the MAGTF would make preparations for operations upon entering the operations area. The ACE FIE would land at a designated airfield, unload the aviation specific MPF ships, and establish their base of operations. Some risk must be accepted with the entire ACE support capability administratively embarked aboard single ships. Due to the limited operating distance of the rotary-wing aircraft, the ACE land-base will have to be close to the operations area in order to adequately support the MPF MAGTF. Although the majority of the MAGTF will benefit from the advantages outlined in OMFTS, the ACE will still maintain the vulnerabilities and host nation ties of land basing.

Option B(-) was added because the disparity between options A and B was so great. Using personnel as the cost driver, accommodations were reduced to 4,600 Marines. All other capabilities remained the same as option B. The initial 4,600 Marines would embark the MPSRON at the ISEP, while the remainder of the MAGTF is staged at the ACE base. After the initial force is employed, the remaining CE, GCE, and CSSE

⁴⁰ Ibid, 16-18.

Marines would be flown out to the MPSRON to conduct sea-basing operations.⁴¹ This would be a difficult evolution to manage and offers a whole host of concerns over the redeployment of the force and reconstitution of the MPF.

Options C and C(+)

Option C incorporates all the capabilities of option B and adds the rotary-wing portion of the ACE onto the MPSRON. This will include increasing personnel accommodations to 13,500, adding aviation refueling, rearming, and firefighting capabilities, an Air Operations Control Center, aviation maintenance facilities, and hanger space. The fixed-wing portion of the ACE will still be land-based, but its much greater range will make it less constrained to position it in a more secure location. With the vertical lift assets sea-based, a more immediate ability to respond will be added. The aircraft will also have the operating range to perform from over the horizon to objectives deep inland. Employment of option C is the same as option B, except that two additional day will be required at the ISEP to assemble and test the rotary-wing aircraft and embark the additional Marines and equipment onto the MPSRON.⁴²

Option C(+) differs in that it does not envision employment of the fixed-wing portion of the ACE. It calls for the functions normally provided by these assets to be supported by aircraft from the carrier battle group and ATF. This option would provide no MPF support for fixed-wing aircraft and eliminate the aviation specific MPF ships.

⁴¹ Ibid, 17.

⁴² CRM 98-29, *MAA for MPF Future Sea-Basing Concepts: Volume I*, 18.

This will provide independence from land-basing any portion of the MAGTF and host nation support, but it reduces a significant capability of the MAGTF's combat power.⁴³

Option D

Option D provides for all elements of the MAGTF to be embarked aboard the MPSRON except the EA-6B and KC-130 aircraft. It will require the development for two aviation variant ships per MPSRON that are capable of launching and receiving the VSTOL JSF. They will need appropriate elevators and standby spots that will not interfere with the conduct of MPF operations from the ships. Capabilities will have to be greatly improved for aviation fueling, arming, firefighting, maintenance, and aircraft control. Personnel accommodations will have to be increased to support 16,400 Marines. Employment of this option will be similar to the previous options, but additional time at the ISEP may be needed to embark the added personnel and equipment. Option D is the only option that meets all the mission and operational requirements outlined for MPF 2010.⁴⁴

Option E

Option E provides the upper range of capability comparisons. For this option, a Mobile Offshore Base (MOB) developed by McDermott Inc. is used. The MPSRON would be comprised of five 1,000-foot sections that can be connected to form the MOB with a 5,000-foot runway on the weather deck. This in theory will permit C-17 strategic aircraft to land on and launch from the MOB. This is the epitome of the sea-basing concept. The entire 17,000 Marine MAGTF, including the EA-6B and KC-130 aircraft, will be able to

⁴³ Ibid, 19.

⁴⁴ Ibid, 19.

operate from the MOB. It eliminates all dependence upon land and requirements for an ISEP. The employment scenario has the FIE using C-17 and C-130 aircraft to land directly on the MOB after the platform has transited to the area of operations and been assembled.⁴⁵

The MOB is an outstanding concept, but there are several issues with it that must be addressed before it can be considered a viable option for MPF 2010. The transit speed is less than 10 knots, which will require as much as three times the transit period as the other options. In most cases, the FIE will have to wait for the MOB to be assembled, but the MOB will save a large portion of this time without the requirement for an ISEP. Speed will be more of a factor in this option's flexibility to respond to smaller scale contingencies when the MOB will not be established and less than a full MPSRON is needed. In this case, the Marines will be in the operations area awaiting the arrival of the MPF equipment. Additionally, the MOB will lack maneuverability after it is established, which will limit the force projection requirements of OMFTS. The MOB will also offer a very large target signature once assembled, which raises considerable concern over the vulnerability of an entire MPSRON.

Figure 1 provides a graphic measure of effectiveness for the capability options developed for MPF 2010. Aviation capability is the most discernable and difficult factor between the options. Other than option B(-), it is the basis for accommodations of MAGTF personnel numbers increasing with added sea-based capabilities. Without sea-based rotary-wing assets, force projection and sea-based logistics capabilities are reduced for options B and B(-) due to their limited operating range. Without including the MOB, the MPF 2010 MAGTF has the greatest vulnerability when its ACE is land-based near

⁴⁵ Ibid, 20.

the area of operations. Additionally, option C(+) has a reduced force projection capability without its dedicated fixed-wing element. The cost drivers of cargo stowage/accessibility and personnel accommodations were determined primarily by the desired capability range and could not be altered significantly to provide additional measures for acquisition costs.⁴⁶

Figure 1. Measures of effectiveness for MPF 2010 capability options

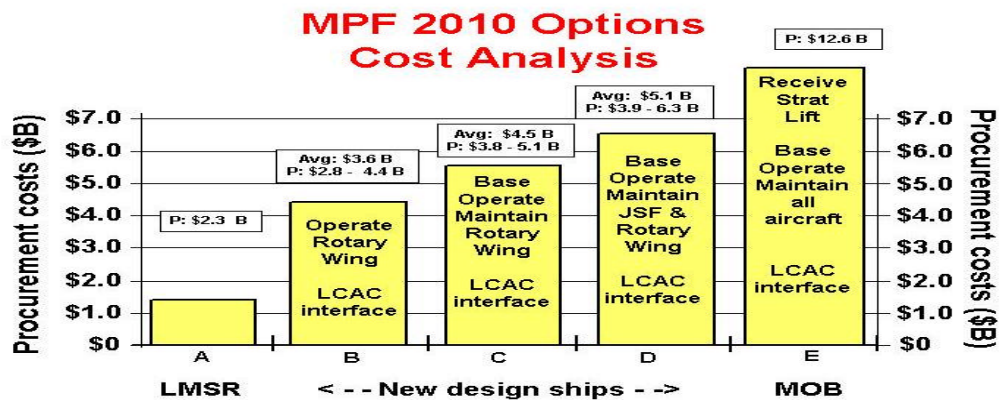
OPTION	SEA-BASED ACCOMMODATIONS	SEA-BASED LOGISTICS	AVIATION CAPABILITY	FORCE- PROJ CAPABILITY	VULNERABILITY
A	400	None	None	None	High
B(-)	4,600	Reduced	Rotary-Wing Interface	Limited	High
B	10,600	Reduced	Rotary-Wing Interface	Reduced	ACE Only
C	13,500	Capable	Rotary-Wing Basing	Capable	Low
C(+)	13,500	Capable	Rotary-Wing Basing	Reduced	Low
D	16,400	Capable	JSF and Rotary Wing Basing	Capable	Low
E	17,000	Capable	Fixed and Rotary Wing Basing	Limited	High – Missile

During the second phase of the CNA analysis, the two contracted ship agents developed platform concepts and acquisition costs to support each option. Each took a different approach and developed a wide range of ship capabilities and costs. The specifics of the different platforms will not be discussed, as the final design will most likely incorporate the best features of both agents. Neither agents correctly addressed all the issues, but the costs they developed provided a range that the platform's acquisition price is expected to fall within. Figure 2 shows the range of costs for a single MPSRON in each option. Options B(-) and C(+) did not significantly differ from the base option to

⁴⁶ CRM 98-29, *MAA for MPF Future Sea-Basing Concepts: Volume I*, 3.

consider their reduced capabilities. Each option is listed with its core increase of capability and shows the range of estimates above it. The lower estimates were provided by BLA. BLA estimated using fewer, but larger, ships in their concept, while AME estimated using more ships that had better port access and spread load capabilities.⁴⁷

Figure 2. MPF 2010 Options Cost Analysis



The average cost of the two projected estimates given for option B, C, and D, provides a basis to compare all the options. Option A has the lowest acquisition cost, but it does not possess any of the desired capabilities to be considered as an option for MPF 2010. Option E provides the greatest sea-basing capability, but its much higher cost and previously addressed issues make it an unrealistic option as well.⁴⁸ Using option B as the baseline, options C and D have a 20 percent and 29 percent greater cost respectively over the base acquisition. Option D will cost approximately 12 percent more than option C. While these figures provide little practical value, they do provide a useful demonstration of what each added capability will require. The final decision will be determined by how

⁴⁷ Ibid, 88.

well the need for the additional capabilities is presented to justify the increased expenditures.

What is the Right Option for MPF 2010

The current MPF ships will have to be replaced or a new, and likely very expensive, lease will have to be established. If the ships are to be replaced, the decision should be made to acquire a platform that meets the requirements of the Marine Corps' leading edge concepts. It will have to support sea-based operations, sustained logistics, and littoral maneuver, as well as retaining the capabilities of the current program. The only options that adequately meet these requirements are those identified as option C and option D. The decision with which option to proceed will definitely have to consider the financial aspects, but all the options are expensive. If an additional 10-20 percent will acquire a platform that will provide significantly more capabilities and keep it viable through the middle of the 21st Century, the decision should be made to develop that platform as an investment for the future. If a less capable platform is decided on, future modifications, upgrades, or replacement will most likely be required to maintain its utility. This will result in a much higher total cost than if the capability was purchased at the outset, as ample examples of previous program acquisitions have shown. There is an intangible cost to deferring capabilities as well. The cost of not having a capability when it is needed may be in the form of defeat.

Based on this, option D should be selected as the platform for MPF 2010. It is the only option that substantially meets the capability requirements outlined in the concepts of MPF 2010 and Beyond, OMFTS, STOM, and Seabased Logistics. It permits the operation of all MAGTF elements from a sea-base, which eliminates host nation support

⁴⁸ Ibid, 90.

requirements and significantly reduces the vulnerability to asymmetric threat. It has the required interface points to facilitate indefinite sustainment and force projection, and it is configured to provide the combatant commander with a flexible range of employment options. The greatest obstacle to proceeding with option D, other than funds, is that the Navy views its JSF basing capability as competition to their aircraft carriers.⁴⁹ The capabilities list for MPF 2010 specifically states that it will not have a forcible entry capability to alleviate this concern, but much more reassurance will be required to gain their support. Navy support is crucial for the realization of MPF 2010, so until they view option D in the same light as the Marine Corps, other options need to be explored.

Option C(+) theoretically offers the same capabilities as option D, but it is at the cost of the dedicated fixed-wing portion of the MAGTF. This is a loss of an integral and powerful element of the MAGTF's combat capabilities, and it is unlikely to be adequately substituted by Navy or ATF aircraft that have their own functions to perform. Without the dedicated fixed-wing assets, employment of the option C(+) platform will always be tied to availability of outside support, which reduces its flexibility to rapidly respond. These limitations make option C(+) an unsuitable candidate for MPF 2010.

Option C offers the second best choice if the Navy cannot be convinced of the greater utility in option D. It meets the majority of the capability requirements outlined in OMFTS and its subordinate concepts, and falls short only in that it must land-base the fixed-wing portion of the ACE. This will require some host nation support and the acceptance of some risk, but it will not deter the successful employment of the MPF 2010 concept. In larger scale conflicts, the Army and Air Force will have to establish a secure rear area of operations anyway, which will provide a safer location to employ the MPF

⁴⁹ Maj Curatola interview.

fixed-wing assets without degrading support to the MAGTF or limiting its capability within the design of MPF 2010. Option D offers the truest capability to realize all the goals of MPF 2010, but if it is not accepted, option C allows the best opportunity to meet the intent of MPF 2010.

A Hazy Future

The maritime prepositioning concept has proven itself as a capable strategic force multiplier and a means to meet the goals of the Strategic Mobility Enhancement initiative. This has been adequately demonstrated since its inception, but the demands required of the OMFTS concept are not consistent with the capabilities of the current MPF program and threaten the future utility of MPF for the Marine Corps. Thus, the current program must evolve into that envisioned for MPF 2010 or the expectations of OMFTS will have to be drastically altered. The potential benefits to face the world's growing instability and complexity are too great not to proceed and easily justify the development of a suitable MPF 2010 platform. It will provide the combatant commander with an unprecedented power projection capability to generate overwhelming tempo and momentum to strike the enemy's critical vulnerabilities, while greatly reducing our dependence on host-nation support and minimizing our own vulnerabilities. The question is in defining what is the suitable MPF 2010 platform.

MPF 2010 is still a long way off, and there are many issues remaining that will have to be dealt with prior to any real progress. The first issue is deciding on which option to base the MPF 2010 platform. As discussed, option D is the only choice that substantially meets all the requirements for MPF 2010 and has the greatest opportunity to

endure through the middle of the 21st Century. Until the Navy endorses this option, it will be a difficult obstacle to overcome. The Navy would be more comfortable with capabilities similar to those outlined for option B, but it neglects to realize that this would leave the ACE assets, which are an essential element to the success of OMFTS, more vulnerable and much less capable than today. It is possible that some middle ground will be found in option C, but this would only minimally support the intent of OMFTS. Planning concerns will remain for where to base, how to protect, and how to support the fixed-wing portion of the ACE. This could be a difficult task during smaller-scale conflicts where little inter-service support can be expected. The Marine Corps should pursue the option that best supports its needs and must actively address the Navy's concerns by developing measures that will elicit their support for option D.

The next and most difficult hurdle to overcome will be justifying the costs. MPF 2010 will be expensive and face much budgetary opposition. The value of the increased capabilities will have to be "sold" to the decision-makers and fought for during the budget process to justify the program. It could be argued that the cost of MPF 2010 is too great for an asset of limited employment, but this would be dismissing its latent deterrence value. Conflicts can be prevented simply by the arrival of the MPF ships into a region, which is infinitely more valuable than when the MPF MAGTF is employed. The loss of life, equipment, and expenditures that would be experienced in a conflict easily document this. The current program has already demonstrated this value, but the increased capabilities of MPF 2010 stand to multiply this effect. Adversaries will be much more threatened by a force that they are unable to target and powerless to prevent its maneuver. The Marine Corps must ensure that the value of these increased

capabilities are clearly understood and provide a sound argument to justify the expenditure for the capabilities it desires.

It is unlikely that these matters will be settled soon enough to build the MPF 2010 platforms before the leases on the current ships expire. This issue must be addressed quickly to prevent the loss of our maritime prepositioning capability or face the inflated costs of a last minute contract. There has been some discussion towards buying-out the leased ships to cover the time shortfall, but the expenditure for this would make the argument for justifying the costs of a new platform more difficult. It would also be much easier to push MPF 2010 back if the current ships are owned and do not have an expiration date. The shortfall between the time that the current leases expire and the expected delivery date of the new platforms should be anticipated and a contract initiated now to extend the leases through that period. The Marine Corps could then take this time to develop the MPF 2010 program properly and not settle for something less in the name of expediency.

The above issues are not insurmountable. As those outside the Marine Corps realize the substantial force multiplier effect of MPF 2010 and its essential contribution towards the tremendous advantages of OMFTS, opposition to its design and costs will lessen. MPF 2010 offers a prepositioned operational platform that has the ability to more than double the combat power that can be projected from the sea through the current maximum concentration of amphibious ships available to U.S. forces.⁵⁰ With the capabilities as outlined for option D, it will facilitate all the objectives of OMFTS and provide the combatant commander with a flexible and powerful force that can rapidly respond without significant constraints. Adding these capabilities to the increased

deterrent value make the cost of acquiring the new platform a reasonable and worthwhile endeavor. The full realization of the MPF 2010 sea-basing concept will provide a national return in value and allow the Marine Corps to meet the requirements of the National Military Strategy.

⁵⁰ CRM 98-29, *MAA for MPF Future Sea-Basing Concepts: Volume I*, 85.

Appendix A

CAPABILITIES REQUIRED FOR LOGISTICS AND MPF 2010

1. Assumptions
 - 1.1 MEB-sized MAGTF
 - 1.2 Existing equipment suite (less items already in production)
 - 1.3 No physical solution preselected. May be single platform or combination of platforms
 - 1.4 Military will continue to use 20 ft containers. This may require stuffing/repacking of items received in theater via commercial means. This will not be done by MPF(F).
2. Overall characteristics of MPF 2010
 - 2.1 Self-Protection. MPF will be able to provide point defense and passive countermeasures.
 - 2.2 Survivability. It will have requisite internal protective and survivability measures (e.g. ballasting mechanism, firefighting apparatus, etc.)
 - 2.3 Weather Resistant. MPF must be able to operate in at least sea state 3, preferably above.
3. Characteristics related to moving to or from MPF 2010
 - 3.1 Characteristics related to distribution from MPF to forces ashore or within the ATF. Actual quantities to be moved will depend upon the size and composition of forces projected ashore, how much aviation is based/supported from the shore, and the duration/distance involved.
 - 3.1.1 Distribution by Air
 - 3.1.1.1 Must be able to distribute bulk liquids by air. Includes necessary packaging and filling capability aboard ship, and containers (possibly disposable) to make this possible.
 - 3.1.1.2 Must be able to move heavy cargo by air. Includes ability to package, repackage for internal lift by available aircraft.
 - 3.1.1.3 Must be able move vehicles by air
 - 3.1.1.3.1 Procure vehicles which will fit inside available aircraft
 - 3.1.1.3.2 Procure aircraft which will fit larger vehicles
 - 3.1.1.3.3 Provide means to get vehicle to landing platform
 - 3.1.2 Distribution by ground means
 - 3.1.2.1 Must be able to move bulk liquids by surface means
 - 3.1.2.1.1 Must be able to discharge fuel and water pierside.

- 3.1.2.2 Must be able to move heavy cargo by surface means
 - 3.1.2.2.1 Must be able to offload heavy cargo (containers) pierside
- 3.1.2.3 Must be able to move vehicles by surface means. Ramp required to offload vehicles.
- 3.1.2.4 Must be able to move cargo (pallets or other smaller containers) by surface means
 - 3.1.2.4.1 Requires cranes and MHE to allow offload of such cargo
- 3.1.3 Distribution by water
 - 3.1.3.1 Must be able to move bulk liquids by water. Must have means of discharging bulk liquids into surface craft or vehicles/containers aboard such craft.
 - 3.1.3.2 Must be able to move heavy cargo by surface means .
 - 3.1.3.2.1 Must be able to move containers and other heavy cargo.
 - 3.1.3.2.2 Must be able to load/unload containers into small craft.
 - 3.1.3.3 Must be able to move vehicles by surface means. Must be able to load vehicles into water craft.
 - 3.1.3.4 Must be able to move cargo by surface means. Must be able to load palletized cargo into water craft.
 - 3.1.3.5 Implied capabilities
 - 3.1.3.5.1 Lighterage. Must have and be able to support appropriate lighterage to handle vehicles, containers, personnel, etc.
 - 3.1.3.5.2 Well Deck. Must have sheltered area in which water craft can be berthed, loaded, unloaded and serviced.
- 3.2 Characteristics related to moving from theater or CONUS to MPF(F). Must be able to receive and store the following quantities of items
 - 400-550 dry cargo s/t per day
 - 135-175k gal of fuel/day
 - 105k gal of fuel/day

These quantities represent the entire consumption of the MEB, regardless of how much is operating ashore or from the “sea base”.

 - 3.2.1 Theater movement by air
 - 3.2.1.1 Flight deck capable of accommodating LTR
 - 3.2.1.2 Aircraft support capabilities (flight deck control, firefighting, fueling (maybe))
 - 3.2.2 Theater movement by surface
 - 3.2.2.1 Cranes capable of on/offloading containers and cargo

- 3.2.2.2 Vehicle RORO ramp sufficient to handle largest type of vehicle
 - 3.2.3 Theater movement by water
 - 3.2.3.1 Need well deck to allow protected docking of small craft
 - 3.2.3.2 Ability to receive and store bulk liquids. Must be able to receive ship-to-ship bulk liquids up to sea state 3.
 - 3.2.3.3 Ability to receive heavy cargo. Must be able to
 - 3.2.3.4 Ability to receive vehicles
 - 3.2.3.5 Ability to receive cargo
- 4. Characteristics of activities performed aboard MPF 2010
 - 4.1 Characteristics related to supporting equipment aboard MPF 2010
 - 4.1.1 Maintenance – facilities and resources to conduct 1st through 3rd and limited 4th echelon maintenance on embarked equipment and equipment evacuated from the maneuver forces. How much is done aboard MPF depends on emerging maintenance concept and degree to which in-theater support base can be used.
 - 4.1.2 Storage – facilities and methods to manage and store all supply required to support the maneuver forces.
 - 4.1.3 Wash down – the ability to washdown all types of equipment being reconstituted aboard the ship.
 - 4.1.4 Battery Servicing – facilities and resources to service and store batteries in support of shipboard and the maneuver forces’ operations.
 - 4.1.5 JP8 handling – ability to receive aircraft and back load ground tactical equipment fuel with JP-8 per the requirements specified by NAVSEA and NAVAIR regulations.
 - 4.1.6 Decontaminating equipment returning to MPF. May require portable facility ashore, but also probably indicates holding area and washdown facility (with trap for runoff) aboard ship.
 - 4.2 Characteristics related to supporting individuals aboard MPF 2010
 - 4.2.1 Berthing
 - 4.2.1.1 Berthing for MPF Crew
 - 4.2.1.2 Berthing for personnel who will marry up with embarked equipment
 - 4.2.2 Messing
 - 4.2.2.1 Capable of supporting MPF crew and embarked personnel. Minimum requirement for personnel augmentation from embarked units.
 - 4.2.2.2 Capability to prepare, package, and transport hot meals to the maneuver forces.
 - 4.2.3 Training

- 4.2.3.1 Facilities for physical exercise to maintain physical condition and acclimatization of embarked personnel
- 4.2.3.2 Facilities with computers
 - 4.2.3.2.1 Computer based training
 - 4.2.3.2.2 Educational opportunities
 - 4.2.3.2.3 Virtual Reality exercises
- 4.2.4 Health Services
 - 4.2.4.1 Medical
 - 4.2.4.1.1 Must be able to handle day-to-day treatment of the ship's crew and embarked personnel
 - 4.2.4.1.2 Will support administration and treatment of personnel who are to be medically evacuated from the theater of operations.
 - 4.2.4.2 Dental
 - 4.2.4.2.1 Must be able to handle day-to-day treatment of the ship's crew and embarked personnel
 - 4.2.4.2.2 Will provide support to the administration and treatment of personnel who are to be medically evacuated from the theater of operations.
- 4.2.5 Evacuation of casualties
 - 4.2.5.1 Must provide support to the administration and treatment of personnel who are to be medically evacuated from the theater of operations.
- 4.2.6 EPW handling
 - 4.2.6.1 Provide facilities for processing, storage, and transportation of enemy prisoners of war
- 4.2.7 Laundry
 - 4.2.7.1 Provide laundry services for MPF(F) crew and embarked personnel
 - 4.2.7.2 Be able to expand to support Laundry services for additional task force personnel during extended duration operations
- 4.2.8 Recreation
 - 4.2.8.1 Provide facilities for physical exercise
 - 4.2.8.1.1 Weight training
 - 4.2.8.1.2 Aerobic conditioning
 - 4.2.8.1.3 Court athletics-basketball, volleyball, etc
 - 4.2.8.2 Library
 - 4.2.8.3 Group Activities
 - 4.2.8.3.1 Movies (may be via closed circuit TV or VCR)
 - 4.2.8.3.2 Games, arcades
 - 4.2.8.3.3 E-mail communications
 - 4.2.8.3.4 Telephone communications

4.2.8.3.5 Religious observances/ceremonies

4.2.9 Decontaminating personnel returning to MPF. May require portable facility ashore, but also probably indicates holding area and washdown facility (with trap for runoff) aboard ship. Must have way of dealing with contaminated individual equipment.

4.2.10 Administration

4.2.10.1 Provide facilities to support administrative requirements for ship's crew and embarked personnel

4.2.10.2 Be able to expand to support administrative services for additional task force personnel during extended duration operations

4.2.11 Remains. Have appropriate spaces to hold/preserve individual remains (including contaminated remains) until they can be evacuated via theater Mortuary Affairs channels.

4.2.12 Support Activities

4.2.12.1 Financial activities

4.2.12.1.1 Cash machines, etc.

4.2.12.2 Exchange services

4.2.12.2.1 Support on-board activities

4.2.12.2.2 Support shore-based exchange activities
(minimum footprint)

4.3 Characteristics related to supporting units aboard MPF 2010

4.3.1 Command and Control – Provide facilities to support Command and Control

4.3.1.1 Command and Control of forces involved in an operation

4.3.1.2 Command and Control of forces involved in the movement of supplies to and from the MPF

4.3.1.2.1 Air traffic Command and Control

4.3.1.2.2 Seaborne vehicle Command and Control

4.3.1.2.3 Ground transportation Command and Control

4.3.1.3 Command and Control of the MPF as a sustaining “Sea Base”

4.3.1.4 Physical spaces within the MPF to support Command and Control

4.3.1.5 Communications

4.3.1.5.1 Communications Interfaces

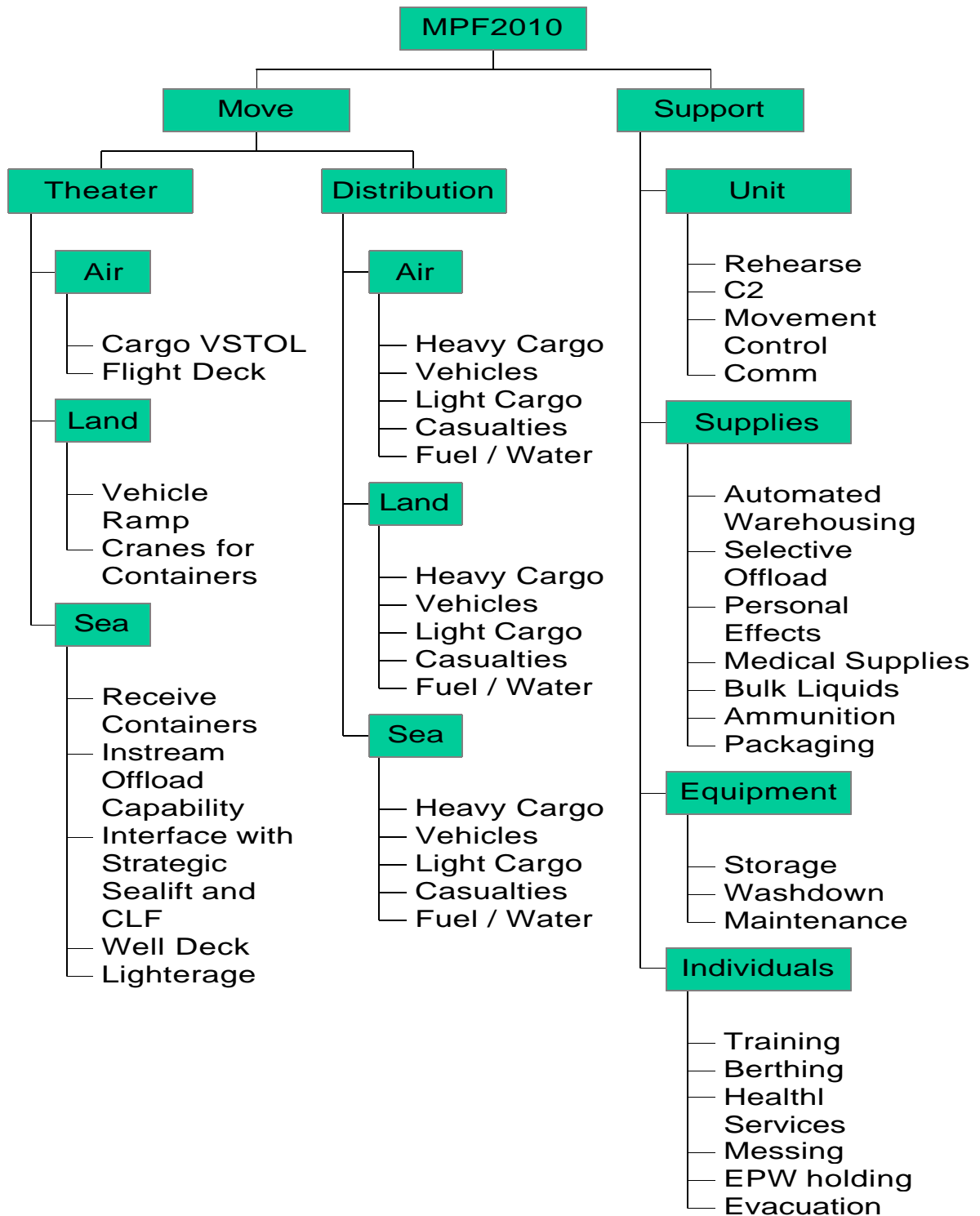
4.3.1.5.1.1 Interfaces to Tactical Operations
Networks

4.3.1.5.1.2 Interfaces to Data Capture Networks –
Autonomic Logistics, GCSS-MC

- 4.3.1.5.1.3 Interfaces to Joint/National Level Networks
 - 4.3.1.5.1.4 Interfaces to Commercial Logistic Networks
 - 4.3.1.5.1.4.1 Commercial Shipping
 - 4.3.1.5.1.4.2 Port Facilities
 - 4.3.1.5.2 Provide capability to support communications reach back to CONUS/Sustaining Base/Supporting Establishment
 - 4.3.1.5.3 Provide Communications Capability to support MPF C2 networks described in 4.3.1.2 and 4.3.1.3.
 - 4.3.1.5.4 Provide internal communications network to facilitate exchange of data amongst MPF elements
 - 4.3.1.5.4.1 Support to onboard AIT/Data Capture devices and networks
 - 4.3.1.5.4.2 Support to automated support systems (e.g. Cargo handling, warehouse...)
 - 4.3.1.5.4.3 Provide capability to link additional MPF elements into a seamless network environment
 - 4.3.2 Rehearsals
 - 4.3.2.1 Provide facilities to support virtual reality based capabilities to support rehearsals for operations
- 4.4 Characteristics related to support materiel aboard MPF 2010
 - 4.4.1 Automated warehousing – automated visibility of and access to assets warehoused aboard the ship.
 - 4.4.2 Repackaging – facilities and resources to repackage supplies into tailored support packages for the maneuver forces.
 - 4.4.3 Selective offload – the ability to selectively offload any embarked equipment and supplies.
 - 4.4.4 Container stuffing/unstuffing – facilities and resources to enable the stuffing and unstuffing of selected containers.
 - 4.4.5 Personal effects of casualties – facilities and resources to manage and store the personal effects of casualties.
 - 4.4.6 Bulk liquid storage and handling
 - 4.4.6.1 capacity to store adequate quantities of bulk liquids to support the maneuver forces
 - 4.4.6.2 capability discharge bulk liquids into containers at the various debarkation point aboard ship.
 - 4.4.6.3 capability to produce water in adequate quantities to support the maneuver forces.
 - 4.4.7 Medical Supplies – facilities and resource to store medical supplies in support of shipboard use and in support of the maneuver forces.

- 4.4.8 Ammunition storage and handling
 - 4.4.8.1 automated visibility of and access to ammunition stored aboard ship. Material handling capability to move ammunition to the various debarkation points aboard ship.
 - 4.4.8.2 capability to load and arm aviation ammunition onto VSTOL aircraft.
- 4.4.9 HAZMAT storage and handling – facilities and resources to handle and store hazardous materials aboard ship.
- 4.4.10 Weapons storage – capability to manage and store weapons being to the embarked forces.
- 4.4.11 Decontaminating supplies returning to MPF. May require portable facility ashore, but also probably indicates holding area and wash down facility (with trap for runoff) aboard ship. Must have way of dealing with contaminated individual equipment.

REQUIRED MPF 2010 LOGISTICS CAPABILITIES



Glossary

ACE	Aviation Combat Element
AME	Advanced Marine Enterprises, Inc. Ship Agents
APA	Army Prepositioning Afloat
ARG	Amphibious Ready Group
ATF	Amphibious Task Force
BLA	Bland Lavis Associates Ship Agents
CE	Command Element
CONUS	Continental United States
CNA	Center for Naval Analyses
CSSE	Combat Service Support Element
DSB	Defense Science Board
FFD	Forward Floating Depot
FIE	Fly-in Echelon
GCE	Ground Combat Element
ISEP	Intermediate Staging and Embarkation Point
JSF	Joint Strike Fighter
JV	Joint Vision
LMSR	Large, Medium Speed RO/RO ship
LO/LO	Load-on/Load-off
MAB	Marine Amphibious Brigade
MAGTF	Marine Air Ground Task Force
MEF	Marine Expeditionary Force
MEU	Marine Expeditionary Unit
MHE	Material Handling Equipment
MOB	Mobile Offshore Base
MOOTW	Military Operations other than War
MPF	Maritime Prepositioning Force
MPF(F)	MPF(Future)
MPS	Maritime Prepositioning Ships
MPSRON	MPF ship squadron
MRS	Mobility Requirements Study
MSC	Military Sealift Command
NMS	National Military Strategy
NTPS	Near-Term Prepositioning Ships
OMFTS	Operational Maneuver from the Sea
POMCUS	Prepositioning of Organizational Materiel Configuration in Unit Sets
RDF	Rapid Deployment Joint Task Force
RO/RO	Roll-on/Roll-off
SME	Strategic Mobility Enhancement
STOM	Ship to Objective Maneuver

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